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Household Credit and Growth: International Evidence

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Household credit and growth: International evidence

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Abstract

This paper has two main objectives. First, it attempts to distinguish the effects of household and enterprise credit on economic growth for a large sample of developing and developed countries. Second, it investigates the channels through which household credit affects economic growth. To do so, a new database covering 143 countries over the period 1995-2014 is employed. Econometric results show that household credit has a negative effect on growth, while business credit has a positive, albeit non significant, impact on growth. The literature provide two possible explanations to justify the negative effect of household credit. On the one hand, household credit expansion can induce more financial fragility. On the other hand, the negative impact of household credit could be explained by its effect on saving behaviors. Results provide some evidence indicating that the negative effect of household credit is more driven by the latter than the former.

Keywords: Financial development; Household credit; Growth; Savings

JEL classification: E44; G21; O16

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1 Introduction

A common belief found in the literature is that greater financial depth facilitates faster growth. However, in the wake of the recent financial crisis, doubts have been raised about this notion and recent studies have confirmed these doubts (Rousseau and Wachtel, 2011; Valickova et al., 2015). Several theories have been put forward to justify the "vanishing effect" of finance on growth. One explanation is based on the idea that too much finance reduces growth. Some authors argue that beyond a certain threshold, financial depth no longer has a positive effect on growth (Arcand et al., 2015). Other economists argue that financial development may only affect convergence towards equilibrium and may not have any effect on steady-state growth (Aghion et al., 2005) or that equity market growth has substituted for the role of banks. However, existing empirical papers fail to provide clear support for any of these views (Rousseau and Wachtel, 2011).

This work explores another explanation based on the distinction between household and enterprise credit for two main reasons. First, recent increase in financial depth has been driven by the expansion of credit to households not only in developed but also in developing countries (Léon, 2018a).

Second, the expansion of household credit could explain the absence of effect of credit to growth. Theory provides ambiguous predictions about the effect of household credit on economic growth. Access to credit by households could drive economic growth if loans granted to households stimulates (domestic) demand. In addition, it could facilitate human capital investment and accumulation (Galor and Zeira, 1993). Finally, household credit may help to smooth consumption (Zeldes, 1989) and may limit macroeconomic volatility. An opposite view states that household credit can hamper growth through two main channels: *(i)* the instability channel; and, *(ii)* the savings channel. First, household credit can increase the stock of debt, which may depress growth through larger debt servicing out of income and therefore a negative wealth effect on consumption. In addition, an increase of household credit may induce a debt overhang effect with negative

effect on household ability to repay and therefore on financial stability (Büyükkarabacak and Valev, 2010; Jordà et al., 2015). Second, Jappelli and Pagano (1994) argue that household credit may reduce growth through its detrimental impact on savings. Access to credit by households can relax liquidity constraints, and therefore reduce precautionary savings (Deaton, 1991) or through an indirect wealth effect (Koskela et al., 1992). The answer to which of these views best describes the reality is ultimately an empirical issue.

This paper contributes to this literature in two ways. First, we extend previous works by considering a large range of developed and developing countries. Only a handful of papers have investigated this question and they mainly concentrated on advanced countries (Sassi and Gasmi, 2014; Mian et al., 2016; Bezemer et al., 2016). In general, they document that an increase in household credit has a detrimental effect on subsequent output growth. To our knowledge, only Beck et al. (2012) consider both emerging and developed economies. However, due to lack of data, they focus on 45 countries and employ basic cross-country regressions. We extend the range of countries considered and exploit panel dimension of data to provide more robust findings. We document that household credit has a detrimental effect on growth.

Second, we try to understand why higher levels of household credit induce lower growth rates. As explained above, there are two main candidates. First, the expansion of household credit may increase the debt-burden in the present without delivering higher income flows in the future (if credit is not used for developing income-generating activities) inducing more financial fragilities (*instability channel*). The alternative channel, advanced by Jappelli and Pagano (1994), is the *savings channel*. We provide some evidence indicating that the negative effect of household credit is more driven by the latter than the former.

The remainder of the paper is organized as follows. Section 2 describes the data and methodology. Section 3 presents econometric results. The final section concludes.

2 Data and methodology

2.1 Methodology

To empirically investigate the effect of credit to growth, we replicate the usual methodology employed in the finance-growth literature (e.g., Arcand et al., 2015). Formally, the estimated model is as follows:

$$Y_{it} = \beta_1 HC_{it} + \beta_2 EC_{it} + \Gamma \mathbf{X}_{it} + \alpha_i + \alpha_t + u_{it} \tag{1}$$

where i and t refer to country and period, respectively. Y_{it} is the average growth rate of real GDP per capita, HC_{it} is the initial level of household credit to GDP and EC_{it} the enterprise credit over GDP, and $\mathbf{X}_{it}$ is a set of explanatory variables. We add a range of country- (α_i) and time-dummies (α_t). Existing literature on credit structure (Beck et al., 2012; Sassi and Gasmi, 2014) points out that business credit is beneficial for growth, while household credit is not. I therefore expect that $\beta_2 > 0$ and $\beta_1 = 0$ (or $\beta_1 < 0$). However, according to Bezemer et al. (2016)'s findings, both β_1 and β_2 could be negative.

For sake of brievity, we only display results based on panel data.[1]. It is usual in the literature to employ non-overlapping five-year periods to control for business cycles. Given the short time span, we follow Bezemer et al. (2016) and use 3-year periods. We start with a baseline fixed-effect (FE) model. The presence of initial GDP per capita, however, puts the model inside the context of a dynamic panel model and FE model is no longer valid. As is now standard in growth literature with limited time-periods, we employ the GMM-system estimator proposed by Blundell and Bond (1998). All explanatory variables are considered as weakly exogenous and available lagged values are used as internal instruments.[2] To improve identification, we add external instruments, namely legal origin and religious composition (Beck et al., 2012; Sassi and Gasmi, 2014).

[1] Econometric results based on cross-country analysis are in line with panel specification and available upon request.

[2] Considering all explanatory variables as endogenous and therefore using two lags and more as instruments provides close results.

2.2 Data

Data on household credit and firm credit are extracted from the Credit Structure Database (CSD), previously described in Léon (2018b).[3] The CSD differs from existing datasets in two aspects. Firstly, it considers 143 countries spanning different periods, depending on data availability, from 1995 to 2014. Other databases covered less than 50 countries, mainly from advanced economies.[4] Considering a large range of countries allows us to include economies from all levels of development and from all continents. In addition, panel data structure allows to study evolution of credit structure over time and provide more robust econometric estimations.

Secondly, obtaining reliable information on household credit is difficult, especially in less developed countries. A solution is to define credit to household has a residual. For instance, Beck et al. (2012), who collect data only on business credit, compute credit to households as the difference between overall credit (extracted from the Financial Structure Database) and enterprise credit. Rather, CSD reported credit to household when explicit data was reported, therefore improving reliability of data. For more details about the construction and relevance of CSD, an interesting reader may refer to Léon (2018a).

To select the list of control variables, we follow the finance-growth literature (e.g. Arcand et al., 2015). Control variables ($\mathbf{X}_{it}$) include the initial level of GDP per capita, the inflation rate (computed from the consumer price index), the level of education assessed by the secondary school enrollment rate, trade openness (i.e. imports plus exports to GDP) and government final consumption expenditure to GDP. All of these variables are extracted from the World Development Indicators. To reduce any simultaneity bias, initial values rather than average values for all explanatory variables are employed. All independent variables are in logs.

Regressions are run on a sample of 126 countries over the period 1995-2014 due to the

[3]Data are available at `https://sites.google.com/site/florianleon/data/data`.

[4]45 countries for Beck et al. (2012)'s database, 27 European countries for Sassi and Gasmi (2014)'s database, 46 countries for Bezemer et al. (2016)'s database and 30 countries for Mian et al. (2016)'s database.

Table 1: Descriptive statistics and correlations

	Summary statistics					Correlations								
	Obs	Mean	Std. Dev	Min	Max	GR.	TC	HC	EC	GDP	GOV	TRA	INF	EDU
GROWTH	496	2.34	3.25	-11.83	25.11	1								
TC	496	51.25	41.01	0.56	309.82	-0.25	1							
HC	496	21.29	21.83	0.00	138.80	-0.24	0.92	1						
EC	496	29.96	22.56	0.34	171.02	-0.22	0.93	0.71	1					
IGDP	496	12633	15607	205	85491	-0.21	0.63	0.67	0.49	1				
GOV	496	16.53	6.90	3.46	103.55	-0.07	0.15	0.17	0.11	0.21	1			
TRADE	496	88.46	47.40	16.75	449.99	0.08	0.23	0.24	0.20	0.25	0.05	1		
INF	496	6.18	16.64	-4.48	293.68	0.05	-0.19	-0.19	-0.17	-0.15	-0.04	-0.03	1	
EDUC	496	84.92	28.20	6.89	158.80	-0.04	0.51	0.55	0.39	0.57	0.25	0.16	-0.13	1

lack of control variables. The list of countries considered for estimations is presented in Table A1 (column sample - regression).

3 Results

3.1 Descriptive statistics

Table 1 report descriptive statistics and correlations. The most striking feature is the negative correlation between (total, household and enterprise) credit and economic growth. These figures are in line with the findings from Bezemer et al. (2016) but also contradict a large body of the literature documenting a positive relationship between finance and growth (Ang, 2008). As documented in Figure A1 in Appendix, the negative correlations are not specific to the database considered and that growth and credit to GDP have been negatively correlated since 2001 (i.e., before the 2008 global financial crisis). In addition, even if absolute coefficients are higher for household credit, enterprise credit is not positively correlated with growth.

3.2 Econometric results

Before investigating the effect of household credit and firm credit separately, we focus on the effect of total credit (defined as the sum of firm and household credit). This approach

allows us to valid our econometric model. We consider three different specifications in Table 2: static panel in column [1], dynamic panel without external instruments in column [2] and dynamic panel with internal and external instruments in column [3]. The usual diagnostic tests associated to the GMM-system estimator are reported at the bottom of the table (Arellano tests for autocorrelation and Hansen over-identification test). The different specifications pass the usual tests. Econometric results indicate that total credit has no statistical impact on economic growth, in line with the vanishing effect (Rousseau and Wachtel, 2011; Bezemer et al., 2016).

We then decompose total credit into household credit and firm credit to test whether the structure of credit matters. In column [4] of Table 2, we consider only household credit. We include only firm credit in column [5] and household credit and firm credit in the last column. We only display estimations using the Blundell and Bond (1998)'s GMM-system estimator with internal and external instruments. Results reported in Table 2 provides two main messages. First, while we could expect a positive effect of business credit, the data analysis does not give strong support for this view. Coefficients associated with firm credit are positive but never statistically significant. Second, household credit is detrimental for growth. Coefficient associated with household credit is always negative and statistically significant at the 5% level in the complete model (column 6). The economic impact is far from anecdotal: a one standard deviation increase of household credit decreases growth by more than 1.5 points. This finding is in line with those obtained by Sassi and Gasmi (2014) and Mian et al. (2016) on different samples (European and OECD countries, respectively) but does not support results from Beck et al. (2012) that document a positive, albeit moderate, impact of household credit.

We run a battery of sensitivity tests (unreported for sake of brevity but available upon request).[5] First, we consider cross-country analysis. Second, we consider the level of credit

[5]We also tested some non-linearities according to the level of financial development (quadratic form) or to the level of income (distinction between developed and developing countries) without providing a clear conclusion. More robustness tests have provided in a previous version (Léon, 2016).

Table 2: Econometric results

	Total credit			Household vs. firm credit		
	FE	GMM-S.	GMM-S.	GMM-S.	GMM-S.	GMM-S.
	[1]	[2]	[3]	[4]	[5]	[6]
TC	-0.4494	-1.0528	-0.3509			
	(-0.80)	(-0.82)	(-0.35)			
HC				-0.9703		-1.3942**
				(-1.42)		(-2.14)
EC					0.7525	1.0589
					(0.93)	(1.05)
IGDP	-8.9027***	-2.6636***	-1.8093**	-0.8710	-2.2959***	-1.2837
	(-4.39)	(-2.95)	(-1.99)	(-1.16)	(-3.66)	(-1.32)
GOV	-2.6135*	-2.1549	-4.0714**	-4.8358***	-3.3763*	-3.6869*
	(-1.80)	(-0.73)	(-2.34)	(-3.18)	(-1.86)	(-1.77)
TRADE	2.5596**	5.0685*	-0.1634	1.3240	-0.4832	0.0340
	(2.15)	(1.81)	(-0.07)	(0.58)	(-0.22)	(0.01)
INF	-0.2086	-0.2475	-0.3231	-0.2410	-0.2443	-0.2819
	(-1.47)	(-1.15)	(-1.49)	(-0.97)	(-1.34)	(-1.19)
EDUC	1.0180	7.7274***	7.6316***	6.4773***	8.0135***	7.8170***
	(1.21)	(3.40)	(2.86)	(2.85)	(3.41)	(3.17)
Constant	71.5710***	-18.8633	-0.6101	-7.2385	-2.4949	-9.6977
	(4.42)	(-1.36)	(-0.08)	(-1.00)	(-0.33)	(-1.37)
Obs	497 (122)	497 (122)	497 (122)	497 (122)	497 (122)	497 (122)
Hansen OID (p-value)		0.670	0.455	0.614	0.582	0.523
# Instruments		44	51	51	51	51
AR(1)		-2.59***	-2.94***	-3.29***	-2.88***	-3.01***
AR(2)		-0.98	-0.16	-1.24	-0.40	-1.21

Dependent variables are the average real per capita GDP growth. All regressions consist of 3-year non-overlapping growth spells. Models are estimated using fixed effect in column [1], Blundell-Bond's GMM-system estimator without external instruments in column [2] and with external instruments (legal origin and religion) in columns [3-6]. AR(1/2) are the usual Arellano tests for autocorrelation and Hansen OID is the Hansen test of over-identification. P-values are calculated form robust standard errors (clustered robust errors for FE specification and robust errors using Windmeijer approach for correction in GMM-System regressions). †, *, **, *** indicate significance at the 15%, 10%, 5% and 1% level, respectively.

instead of log. Third, we add additional control variables (stock market capitalization and institutional development). Fourth, we employ the World bank's Financial Structure Database to compute total credit and household credit as a residual, as done by Beck et al. (2012). Fifth, we exclude outliers (according to level of growth and/or credit). Finally, we change the time period considered for panel data (3-year periods in the baseline). We consider annual observations as in Sassi and Gasmi (2014) and the usual five-year periods. In all tests, our baseline results are confirmed, especially the detrimental impact of household credit on growth.

3.3 Why is household credit detrimental for growth?

Previous results indicate that household credit is detrimental for economic growth, contrary to enterprise credit. A remained issue is to know why household credit is detrimental for growth. There are two main channels through which household credit may depress growth. First, the *instability channel* states that the expansion of household credit may raise the debt-burden in the present without delivering higher flows in the future (if credit is not used for developing income-generating activities), and therefore increase financial instability (Büyükkarabacak and Valev, 2010; Jordà et al., 2015). Second, the *savings channel* posits that access to credit for household could depress savings and therefore growth (Jappelli and Pagano, 1994).

We firstly test the *instability channel*. Due to the lack of data, We cannot scrutinize the effect of debt overhang on households' behaviors. We therefore focus on the relationship between household credit expansion and financial fragility. Recent works have documented that an increase in household debt induces financial fragility (Büyükkarabacak and Valev, 2010; Jordà et al., 2015). We present some additional regressions to test this channel in Table 3. We firstly add variables capturing financial fragility such as a dummy for crisis period in column [1], the ratio of non-performing loans to gross loans in column [2], and an index of banking stability, namely the Z-score index, in column [3]. We then remove the post-crisis period to assess the effect of household credit in normal or

booms periods (column [4]). According to the instability channel, we could expect that the coefficient associated to household credit becomes non-significant when controlling for financial instability or before the GFC. However, results reported in Table 3 show that coefficients associated with household credit remain negative and statistically significant and its economic size is not attenuated when we add variables controlling for instability or exclude GFC period.

Table 3: Transmission channels: Instability vs. saving

	Stability				Saving rate			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Household credit	-1.8195***	-1.3680†	-1.3990**	-2.5265***	-1.3530**	-0.5766	-1.2184*	-0.4905
	(-2.70)	(-1.60)	(-2.07)	(-2.75)	(-2.05)	(-0.97)	(-1.80)	(-0.85)
Firm credit	1.2360	0.7556	0.8721	0.7639	1.0036	-0.7358	0.4813	-0.3137
	(1.14)	(0.78)	(0.80)	(0.59)	(1.01)	(-1.37)	(0.43)	(-0.35)
CRISIS DUMMY	-0.5712**							
	(-2.49)							
NPL		-0.1251***						
		(-2.66)						
Z-SCORE			-0.0085					
			(-0.12)					
SAVING						0.1391***		1.6882**
						(3.57)		(2.34)
Obs	497	415	474	315	492	492	463	463
Country	122	113	118	113	121	121	116	116
# Instr	65	64	65	44	58	65	58	65
AR(1)	-3.02***	-2.88***	-2.80***	-1.20	-3.01***	-2.62***	-2.67***	-2.35***
AR(2)	-0.26	-1.62	-1.17	-1.05	-1.16	-1.17	-1.04	-1.03
Hansen OID (p-value)	0.744	0.221	0.451	0.067	0.506	0.392	0.389	0.624

Dependent variables are the average real per capita GDP growth. All regressions consist of 3-year non-overlapping growth spells. Models are estimated using Blundell-Bond's GMM-system estimator with internal instruments and external instruments (legal origin and religion). All specifications include control variables and period dummies (not reported in the table). The list of control variables included the initial level of GDP, the government final consumption over GDP, the trade openness (imports plus exports divided by GDP), the inflation rate, and the level of education (secondary school enrolment), all in log. AR(1/2) are the usual Arellano tests for autocorrelation and Hansen OID is the Hansen test of over-identification. P-values are calculated form robust standard errors (clustered robust errors for FE specification and robust errors using Windmeijer approach for correction in GMM-System regressions). †, *, **, *** indicate significance at the 15%, 10%, 5% and 1% level, respectively.

We then test the *savings channel*. Jappelli and Pagano (1994) show that promoting household credit has a negative effect on economic growth trough reducing saving rate. In doing so, we add the saving rate in the baseline regression. We consider the domestic saving rate provided by the World Development Indicators (in level and in log).[6] Two

[6]Insofar as the number of observations is reduced when saving rate is include, we reported the baseline

main findings can be underlined: (i) the saving rate is positively correlated with growth, and statistically robust; (ii) with the inclusion of saving rate, coefficient associated with household credit turns to non-significant, and its economic impact is reduced by a half. Put differently, it seems that the negative effect of household credit is explained by its effect on saving rate, at least partially. This finding is in line with predictions of Jappelli and Pagano (1994). It is also in line with those obtained by Mian et al. (2016) indicating that credit supply may lead households to borrow and consume more than is socially desirable.

4 Conclusion

While many works have documented the positive effect of financial depth for growth, recent contributions in the finance-growth nexus has shed light on the vanishing effect of credit to growth in recent years. This paper focuses on a recent view that has emerged in the literature stating that credit structure matters. Only an handful of papers have investigated this question and they mainly concentrated on advanced countries, at the notable exception of Beck et al. (2012) that consider 45 developed and emerging countries (and cross-country regressions only).

Using a new database, the Credit Structure Database (Léon, 2018b), this paper attempts to distinguish the effects of household and enterprise credit on economic growth using a large range of countries. This works provides two main conclusions: (i) household credit tends to be negatively related with growth, contrary to firm credit (that has a positive, albeit insignificant effect on growth); (ii) the negative impact of household credit is more due to a reduction in saving rate (Jappelli and Pagano, 1994) than an increase of financial instability (Büyükkarabacak and Valev, 2010; Jordà et al., 2015).

From a policy perspective, this work raises doubts about policies that stimulate household credit to sustain growth. Household credit is not only not effective to spur growth

model for observations for which the saving rate variable is available in columns [5] and [7]. we then add saving rate in columns [6] (in level) and [8] (in log).

but it is even detrimental for it. From a research perspective, this work can be seen as a first step. It provides a better understanding on the channels through which household credit expansion negatively impacts growth. Econometric results point out the role played by savings. Additional research should focus on the complex linkages between household credit, firm credit and savings. The literature on the nature of relationships between financial development and savings continues to be debatable. In addition, data presented here offer us an opportunity to investigate additional questions related to credit structure. For instance, future works could investigate the relationship between credit structure and inequality or the impact of household credit on social outcomes such as the education level or the child labor.

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Online Appendix

(not for publication)

Appendix A Sample and variable definition

Table A1: Definition of variables

Variable	Definition	Source
GROWTH	Annual growth of GDP per capita	WDI
TC	Total credit to GDP (sum of household and enterprise credit)	Credit Structure Database
HC	Household credit to GDP	Credit Structure Database
EC	Enterprise credit to GDP	Credit Structure Database
IGDP	Initial GDP per capita (constant 200 US$)	WDI
GOV	Government final expenditure over GDP	WDI
TRADE	Total amount of exports plus imports over GDP	WDI
EDUC	Share of the respective age cohort enrolled in secondary schools	WDI
INF	Annual growth of consumer price index	WDI
INSTITUTION	ICRG index of quality of Government	ICRG
CRISIS	Banking crisis dummy	Laeven and Valencia (2013)
STOCK MARKET	Total capitalization over GDP	Global Financial Development
PC	Private credit over GDP	Beck et al. (2010)
Legal origin	Dummies origin for each country's legal system	La Porta et al. (1999)
Religion	Share of catholic, protestant and muslim population in total population	La Porta et al. (1999)